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APHASIA ;

OR,

CEREBRAL LOSS OF SPEECH.

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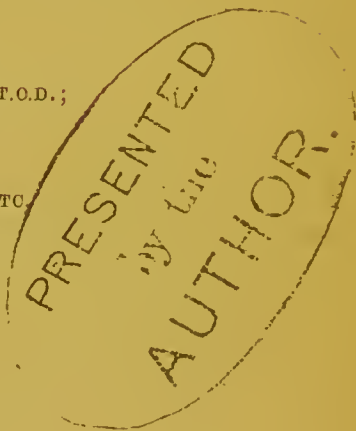
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APHASIA;

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DISORDERS of speech have been observed from a very remote period in connexion with diseases of the brain. Allusions to them occur in the works of the Father of Medicine, and the association of dextral paralysis, with lesion of speech, is noticed in a case in his Epidemics.^a Loss of voice and loss of speech, or aphonia and anaudia, were properly contradistinguished by him, and he shows a sense of the value of these states as prognostics, which is certainly wonderful for his time.^b

Since the period of Hippocrates until within the last few years, injuries of speech did not receive the attention which they deserved. This was due, in part, to their dependent attitude as symptoms, and the want of a fixed basis of reference, and partly to the neglect of the study of language as a science. Still, as M. Jules Falret has shown in his very able digest,^c information of much value upon this subject can be gleaned from the medical writings of our forefathers, an old mine newly opened, and still unexhausted.

^a Hippocratis op. Edit. A. Foes, De Morb. vulg. lib. i. § 7, p. 990—also Coac. præn. p. 174, B.

^b "Loss of speech (*αἱ ἀναυδίαι*) in fever is bad," &c.

^c Archives Générales de Médecine, 1864, Vol. i., pp. 336 and 591.

Many of the examples, it is true, have the air more of singularities, whose interpretation is tacitly bequeathed to the future, than of duly estimated pathological truths. The first step in advance was made, when it occurred to the fertile genius of M. Bouillaud to invert the problem and boldly regard disordered speech as a disease *sui generis*, with its own seat and laws. Although the views of M. Bouillaud respecting the anterior lobes of the brain as the foci of language have not as yet been substantiated, they have the credit of originating theories of even greater interest. Such are those of MM. Dax and Broca, the former limiting the cerebral seat of the speech-faculty to the left hemisphere; the latter fixing its *locus* in the third left frontal convolution.

The claims of "cerebral loss of speech" to rank as a disease in its own right, elicited the widest diversity of opinion in the debates at the Academie de Médecine in 1865. Omitting details on minor points, one section with M. Trousseau sanctioned it, with some modification, as a substantive disease. A second section, including MM. Piorry and Cerise, pronounced it a phantom-malady, a symptom appertaining to various diseases of the brain, and, like the famous *Avvocato del Diavolo*, protested against its admission into the Kalendar. A third section agreed with M. Baillarger, the excellent alienist physician, that while there are some grounds for believing in a special lesion, a positive decision thereupon is premature; so that instead of forcing laws to accord with facts, we should go back and collect facts for laws. In responding to such an invitation, it is not easy for a writer to avoid saying things as well or better said already.

In these countries medical opinion has, on the whole, been favourable to the so-called aphasia. This is due in part to the eloquent leçons of M. Trousseau. But we owe it to the memory of the late Professor Jonathan Osborne, to say that his communication "On the Loss of the Faculty of Speech Depending on Forgetfulness of the Art of using the Vocal Organs," in the *Dublin Journal*, November, 1833, anticipated the explanation for which M. Baillarger has received the credit, and was far in advance of his time. Neither did the subject escape the discursive glance of the late Dr. Graves.—*Dublin Quarterly Journal*, February, 1851. Since M. Broca's announcement in 1861, the subject has received the attention of such able writers as Drs. F. Winslow, Hughlings Jackson, Wilks and Moxon, of London; Dr. Banks, of Dublin, in this Journal,

February, 1865; Drs. Sanders, Scoresby-Jackson, and Anderson, of Edinburgh; Drs. Gairdner and A. Robertson, of Glasgow, and other eminent physicians.

Assuming, then, that aphasia is a morbid unity, and not a simulacrum, the first question is to determine its pathological conditions.

In affections of the brain we meet with various degrees both of injury of the faculty of speech, and of oblivion of words, the latter ranging from transient eclipse to total obseuration. They may occur by themselves, or be accompanied with disorders of other functions. Are we warranted in forming by abstraction a class-disease of speech in cases where the disturbance of this faculty seems the paramount affection? There appears no sufficient reason why loss of speech should not be as well entitled to the name of a disease as loss of voluntary motion, or of sensibility, or of intelligence, all of which occur in nosography as distinct maladies.

The objection to one applies to all, that they generally betoken *structural* alterations in the brain. But as such underlying alterations are not, as yet at least, so definitively settled as to allow us confidently to predict their place, we are still obliged for convenience to name the disease in most cases from some functional injury. But what is to guide us when disorders of several functions, co-ordinate in rank, exist together? Should, for example, aphasia and hemiplegia be present in the same case, is our choice between the two names to depend, or not, upon the relative amount of their functional injuries? Heretofore the speech-lesion was ignored. But M. Broca has changed all this. If hemiplegia accompany aphasia, as it often does, it should, according to him, be regarded, not as a factor in the case, but as an epiphenomenon. Thus he lays down three characters of aphasia, two of them positive, (1) that the intellect continues sound; (2) that verbal memory is the only cerebral function injured; and one negative; (3) that peripheral paralysis of the articulating organs is not the cause of the loss of speech, which is purely cerebral.

A wider experience soon convinced unbiassed observers that M. Broca's tests were too stringent. Cases of aphasia, pure and simple, limited, for a time at least, to loss of verbal memory, do exist, without any material difficulty of utterance, or any signal failure of intelligence, but these stereotyped examples are few. First, the intellect, as a rule, seldom retains its absolute integrity. And here we may remark that some writers, in their pardonable eagerness to

believe that their aphasic patients preserve their powers of rationation unimpaired, are apt, as a sufficient proof of it, to rely very much upon their consciousness of the rational acts of ordinary life, or on their execution of some simple numerical calculations. But what proves too much proves nothing. To try the point, questions should be set which come up to the level of the previous capacity of the individual, and which demand some continuous mental attention. It is in this inability to concentrate the whole thinking power upon a difficult subject that the mind betrays its weakness. As to the second test, the upset of the muscular equilibrium sooner or later, by palsy or spasm, too constantly occurs to allow loss of verbal memory its claim to be considered the solitary function affected. Even the third, though the most constant test, is not unexceptionable, some peculiarity or other of utterance being found, not sufficient, however, as Dr. Sanders observes, "to prevent or seriously to interfere with the articulate pronunciation of words."^a Of this kind we may mention unusual rapidity of speech and blurring out words, or hesitation and drawling, loudness of tone, intermixture of syllables, &c., &c.

It appears, therefore, that loss of the memory of words is not sufficient to explain all the phenomena in those cases, and it fails altogether in clearing up those singular, but well-authenticated exceptions, in which the individual, when attempting articulate language, only gibbers and makes meaningless sounds, but is able to express his ideas correctly in writing. To include the latter variety there is required a second form of aphasia, in which the thing forgotten is not language, but (as in the case given by Dr. Osborne) the acquired art of using the articulating apparatus; or, as others think, a lesion of the centre of co-ordination for the speech-movements; or again, a failure in the transmission of the behests of the will. Hence, the basis of injury in the first form would be a defect in a psychological function, while in the second it would be a flaw in some part of the nervous machinery. Two typical formulæ of aphasia are, therefore, according to our present knowledge, to be discriminated. (1). *Lethological or Amnesic Aphasia*—viz.: That form of defective speech, which is caused by partial or complete forgetfulness of language, both spoken and written, without a sufficient impairment of the intelligence, or difficulty of the articulation, to

^a Edinburgh Monthly Medical Journal, March, 1866.

account for it. (2). *Aneural or Ataxic Aphasia*—viz. : That loss of the faculty of speech, which consists in a partial or total inability to articulate words correctly, without any obvious paralysis of the tongue, lips, &c., while the memory of words and of their significations is retained, and the individual is able to write, though not to speak, intelligibly.

To these two forms there are cognate states, between which and them it is not easy at times to draw the line of demarcation, as we shall see farther on.

The disorders of speech involve an inquiry into the relation between thought and language. Is this relation arbitrary, conventional, or necessary? If, as we learn from Destutt de Tracy, we can have no objective knowledge of other beings in the outer world than ourselves, save by the impressions which they cause us, the use of *signs* for interpreting those impressions becomes one of the first necessities of human existence. But signs are either natural and constant, such as voice, gesture and facial expression,^a or artificial and mutable, such as words, to which nature invites man by the gift of organs, as conditions of speech. Education teaches the child that a sound, uttered by the tongue, recognized by the ear, approved by the judgment, treasured by the memory, is thenceforward to represent to his mind a thought. But for this purpose a permanence of relation between sense and sound must be established. Ideas, being the offspring of the same senses and faculties, are alike in all our species, whereas words, as creatures of the will, are nowhere alike. Speech would, therefore, be unsettled, unless the arbitrary character of words, as sounds,^b could be so modified that, by voluntary agreement amongst peoples, they should not be changeable at will. Hence it is, that language in the concrete, that is, as a tongue, is conventional, and, as society advances in refinement, may become so redundant as to make it painful to recollect all the delicate *nuances* of thought and expression; while in the abstract, that is, the formal use of words as instruments of thinking, language is an obligation almost inseparable from the laws of thought. It draws forth thought from its mysterious recesses, gives it, in the imagery of the old Greek poet, wings for

^a "Sæpe tacens vocem, verbaque vultus habet."

"Me specta, nutusque meos, vultumque loquacem."—OVID.

^b Max Müller endeavours to prove that the primitive roots of language are natural productions.

diffusion,^a imparts fixedness to its flashes, affords a clew in association to trace its whereabouts in the memory, links premiss to premiss in reasoning. "Words," says Bacon, "exercise a reactionary power over the intellect;" the idea calls up the name, and the name in turn suggests the idea. In fact, speech becomes to thought what the atmosphere is to light, its ambient medium, to which it owes perspicuity, colour, and utility. How is this union, which is made life-long by custom and habit, affected by disease? Sometimes thought and speech together, "like the children of our youth, die before us." Sometimes, as in the present disease, words fade away, while ideas more or less subsist. In the latter case natural language is mostly brought into exaggerated use, as a mimetic substitute for words. What elements of speech suffer most in aphasia? Dr. Osborne was of opinion that "the most common failures of memory were to be found amongst nouns, and especially amongst proper names, in consequence of their being less frequently repeated than verbs or prepositions,"^b an observation echoed by Dr. Graves, but anticipated by M. Louyer-Villermay. In my limited experience, verbs and particles, except the most simple of the former, such as the auxiliary verbs, &c., suffer as much as nouns, and some nouns in daily use are at times amongst the soonest forgotten. Proper names are certainly the most perishable, including what is curious, the name of the individual himself, which is supposed to stick to one like the skin. If the first learned be the most durable, it would be in favour of nouns.

An act of speech is a very complex operation. Upon analysis it includes various steps, from pure thought to mechanical utterance, so rapidly successive as to appear simultaneous. All the stages may be reduced for convenience under two heads, which may be termed *cognitive* and *executive*, thought-speech and spoken-speech, the interior and exterior speech of M. Bouillaud.

A. The Cognitive process comprises something like the following states: (a) the direct presentation of an object to the sensorium, or of an idea or image to the mind; or (b) the secondary presentation of an idea, when resuscitated out of unconsciousness by memory; (c) the naming acts, involving past and present conditions, such as learning words as signs, retaining them in memory,

^a "ἔπεα πτερόεντα."—HOMER.

^b Dublin Journal, November, 1833, page 153.

recognizing them as objects of former perceptions; reproducing the right word for the right idea, &c., &c.; (*d*) the aid of other mental states, such as habit, association, attention, &c., which, by long custom and apt concatenations of thought, help us to form those rapid judgments necessary for the quick communications of speech.

B. The Executive process is partly *psychical*, partly *somatic*.

1st. The psychical part consists of the will and the emotions.

(*a*) The will may be termed the head-centre of action. It interposes as legatus between intellect and brain. It initiates the speech-impulse, and thus, in point of time, precedes the intellectual operation, and continues its oversight until the mechanical process be completed.

(*b*) The emotions occupy a much less elevated position. They sometimes, as motives, determine the will to originate speech, sometimes they originate it themselves, and even in despite of the will, by a sudden impulse upon the bodily structures, as is seen in the involuntary ejaculations from bursts of passion or feeling in this and other diseases.

2nd. The somatic or mechanical part of the executive process seems also to comprehend several stages, such as:—(*a*) the reception by the will from the intellect of the thoughts turned into words, and the transmission of them to a motor centre. In this case the worded thought is supposed to be developed through the agency of the grey vesicular cortical surface, and to be conducted by the fibres of the white medullary mass to the corpus striatum as the motor centre. (*b*) The combination of adjustments for the speech movements. This includes a supply of motor force measured to suit the occasion, incitation of the appropriate nerves, association of these into temporary groups, and harmonizing their combined action. Whether this innate modifying power be condensed in central masses, or diffused, we cannot tell; our consciousness only warns us when there is a jar in the movements. (*c*) The transmission of force from the brain to the articulating organs through nerves, as internuntii. (*d*) The muscular contractions, of course very variable for letters of such diversity of sound as labials, dentals, gutturals, &c. (*e*) A vocal apparatus to make the sounds audible, and lubricated to prevent dryness. (*f*) Hearing-organs to establish early a consensus between utterance and sound. Lastly, an external medium of suitable density.

The perfection of speech may be interrupted by defects in any of these stages, or even altogether lost. They represent states very

different from each other, and hence the forms of speechlessness are numerous. For presenting a thorough view of speech, as affected by disease, they all have their value, but as this would widen the question too much, we shall, retaining the term aphasia as a convenient genus, notice such forms as are to be distinguished from *Aphasia proper*.

1st. *Aphasia propter dementiam*.—"Alalie par hébétation."—Mutism from idiocy. A very striking case of congenital speechlessness is now under my care. Mary Cadigan, aged twenty-five, of ordinary development, not deaf, has never articulated a word in her life. She utters sounds, however, which resemble the cries of a wild animal. She has not sense enough to feed herself, while she shows not the least recognition of the person who has fed her for years. She is not paralysed, and when set up on her legs can move forward a few steps, but would fall unless caught. The co-ordinating power over the muscles is almost absent. A case, not unlike this, occurred to M. Breschet, who found the anterior lobes of the brain undeveloped.^a

2nd. *Aphasia surdorum ab ortu*.—Deaf-mutism. This state deserves to be carefully studied in relation to the question how far thinking is impeded by the want of oral language. In these cases the loss of speech is mostly compensated by pantomimic action, so facile and suggestive as to give some warranty for the assumption that gestural signs are as well entitled to a cerebral habitat as verbal.

Connected with *congenital* deaf-mutism is that *acquired* form, more frequent than is supposed, in which the hearing has been abolished by disease at too early an age for the child to learn the sounds of words effectively. A case of this in a servant girl, about twenty-three years old, has just fallen under my notice. She can write a little, and makes an attempt at speaking some words, for instance, sugar is "ducc," pain is "pay," apron "aby," saucepan "dauban," and her own name, Bridget Vaughan, is "Pitchy Baum." There are, however, various expressions used by her, such as duba, dema, dumuff, atehum, didum, jip, &c., which would require a Bunsen or Max Müller to determine what primitive roots they resemble.

3rd. *Aphasia ficta (proæretica, Sauvages)*. Feigned or voluntary mutism. This presents some curious examples of that morbid state of mind which could keep up a deception at so terrible a sacrifice.

^a Andral Clinique Medicale. By Spillan, p. 183.

Sir Walter Scott's beautiful fiction of the mute Fenella occurs to us, in which the fraud so well sustained was at length betrayed through the emotions. Scott gives the history of a real case, in which dumbness was feigned by a woman for three or four years, until one day seeing a scampish boy thieving, she forgot her part, and cried out, "Ah! you little devil's limb," to the horror of the boy, who ran off, in the belief that "dumb Lizzie was a warlock."

4th. *Aphasia ab ecstasi vel melancholia*.—Mutism self imposed from high mental tension or depression. "Sadness and misanthropy with silence," (Hippocrates). The mind absorbed in some dominant idea is insensible to the succession of events going on around.

5th. *Aphasia attonitorum*.—Speechlessness from sudden and intense emotion, especially terror. The effect of the shock is mostly but temporary; however, John Peter Frank refers to three cases where it was lasting. In classical authors, the term aphasia, is only applied to this state.

6th. *Aphasia traumatica*.—Mutism from traumatic causes. Sauvages cites a case in which, from a contusion of the neck, loss of speech lasted two years, and was cured by cathartics. I am indebted to Dr. Hewitt, of Cork, for notes of a like case. A boy named Fanc, aged fifteen, received a kick from a cow, between the nose and forehead, which stunned him, but left apparently at the time no other injury than a few scratches and slight epistaxis, so that he walked after it some miles to a fair. On the fourth day, he was seized, while at work, with vertigo and loss of speech. A fortnight afterwards his head was shaved and blistered without success. Similar counter-irritation by blistering and ung. ant. tart. was used to the throat, and mercury was given to salivation, but without any improvement. He was then taken to Dr. Fowke, of Cloyne, to be mesmerized, which step also failed. After being dumb for seven months, Dr. Hewitt presented him before the Cork Medical Society in 1852. His hearing, taste, and sight were perfect, deglutition easy, and his tongue could be moved in any direction. He could not articulate a single letter of the alphabet. A brief account of the above was published in the *Dublin Medical Press* for 1852. The sequel of the case was curious. He continued twelve months as servant with Dr. Fowke, totally mute, when he got extensive inflammation of the anterior part of the scalp, followed by suppuration, and regained his speech as suddenly as he had lost it eighteen or nineteen months before. He continued in the country nearly two years, having the full use of speech, and

then emigrated to America, where he got married. It appears that he died about two years after; the cause of death was not known.

The following case is abridged from Hippocrates. A beautiful girl, nearly twenty, was struck in the forehead (bregma) with the flat of the hand, by a playmate. She suddenly lost her sight and breath. On returning home she was seized with fever, pain of head, and flushing of face. On seventh day, a cyathus of reddish pus issued from right ear with relief. The fever relapsed, she became *speechless* (anados) and drowsy, the *right* side of her face was drawn, and the tongue paralysed, convulsive tremors set in, and she died on the ninth day.^a

7th. *Aphasia spasmodica*.—Spasmodic mutism. This form is well known in connexion with hysteria and hypochondriasis, and sometimes lasts for weeks or months. Dr. Bright gives two cases of it as hysterical trismus.^b The periodie or intermittent form is curious. It occurs usually in the evening, going off in the morning; and J. P. Frank met with three cases of it; one lasted five months.^c Another case is quaintly described by Dr. T. Willis, author of "*De anima Brutorum*," which he terms "*paralysis spuria*." "I am now attending a modest and prudent woman, who for many years has been liable to this, not only in the members, but also in the tongue. She speaks freely for a time, but after a long or rapid conversation she becomes as mute as a fish, being unable even to say (*γρυ*) gry. After a few hours she recovers speech."^d

8th. *Aphasia a debilitate vocis*.—Aphonia. Here the defect lies in the vocalizing or sound-producing organs, and not in the articulating; a mute cannot articulate, but can utter sounds; an aphonic cannot utter any sound whatever. The two states do not often co-exist.

9th. *Aphasia sympathetica*.—This interesting variety happens at times in the course of other diseases, and recovery usually takes place when the primary ailment has subsided. It seems most frequently associated with some form of fever, chiefly of the gastric or typhoid form, and in young persons. Dr. Osborne gives three examples of this kind. Sauvages mentions a case of it from worm

^a Hippoc. de Morbis Vulgatis, Lib. V., sec. vii., p. 1154.—Foes.

^b Bright's Reports of Medical Cases, Vol. ii., p. 460., cases 215 and 217.

^c J. P. Frank, De Morbis Hom. Cur. French translation by Goudareau, Vol. ii., p. 458.

^d Op. T. Willis, M.D., de Paralyti, p. 406.

fever in a child (*mutitas verminosa*), which was cured after twenty days by the expulsion of thirty-six lumbrici. The child recovered speech, but could not utter the letter B.^a A most striking case is given in full by Dr. Scoresby-Jackson, as a sequela of typhus fever.^b E. Wilson notices the case of a child who became dumb from retrocession of measles, but speech came back two years after. J. P. Frank has observed it in puerperal fever; and Hippocrates has noticed its occurrence in the fevers of pregnant women. It is not uncommon after cerebral affections. Joseph Frank had a case in a child of six years, who was attacked soon after birth with convulsions, and remained mute, though the hearing was perfect.^c As a sequela of epilepsy, it occurred in a policeman, named Tobin, admitted under my care into the Cork North Infirmity, November 22nd, 1866. All the effects of the fit had passed off for some days, except aphasia; he had no loss of verbal memory, he swallowed easily, and moved the tongue in all directions, but could not articulate a word. He was leeches on the temples, and blistered behind the ears, getting bromide of potassium internally, which treatment, after ten days, quite restored this important faculty.

10th. *Aphasia a narcoticis*.—Some kinds of vegetable narcotic poisons possess the property of causing suspension of the speech-faculty, but not as the effect of coma. In the *Dublin Quarterly Journal* for November, 1865, I detailed the occurrence of temporary dumbness in a boy who had eaten the roots of *œnanthe crocata*. Sauvages mentions that robbers infesting Montpellier in his time drugged the wine in taverns with the juice of the seeds of *datura stramonium*; those who drank it could not speak a word for two or three days, though wide awake.^d The berries of *atropa belladonna*, and roots of *hyoscyamus*, are said to have a like effect. The power of alcohol in fusing syllables together, or “clipping the Queen’s English,” is well understood.

11th. *Aphasia a vitio instrumentorum loquendi*.—This includes local injuries of the speech-organs, such as loss of the tongue, or hypertrophy or atrophy of it, morbid adhesions, &c.

12th. *Aphasia a glossolysi* (Sauvages).—Lingual palsy is the most frequent cause of loss of speech, and is mostly connected with deep-

^a Sauvages Nosolog. Method., Tom. i., p. 777.

^b Edin. Monthly Journal, Jan., 1867.

^c Joseph Frank, Prax. Med. Precep., Tom. iv., p. 75. French translation by Bayle.

^d Sauvages loc. cit.

seated cerebral lesions. Romberg describes two forms, *glossoplegia masticatoria* and *articulata*.^a The lesion in the encephalon takes effect upon or near the origin of the hypoglossus nerve, between the olivary and pyramidal bulbs. Lingual palsy may sometimes begin in the peripheral extremity, namely, the substance of the tongue: and in Bell's paralysis, the portio dura may be engaged after its transit from the cranium, affecting the pronunciation of the labial letters, and generally blunting articulation.

Having thus briefly noticed certain varieties of loss of speech, which are not to be confounded with *Aphasia proper*, we proceed to consider the latter in its relations to the cognitive faculties and the operative mechanism. The disorders of speech connected with the former, without including the speechlessness of profound coma, may be ranged under two heads; (1) those wherein the intellect and the memory of language are obscured alike, and (2) those in which the intellect has originally suffered less than verbal memory, or has righted itself, while the memory of words has remained impaired. The first of these states of oblivion of words cannot strictly be considered aphasia, for utterance is mostly perfect, and a species of talkativeness often present, but language has ceased to be used with precision. Softening of the brain, involving the vesicular and fibrous structures is going on, the intellect grows weaker day by day, and language, its reflex, has no relevance. Memory fails in its relations of time and place; judgment can no longer elasp the links of thought, and sensations leave but faint traces in the sensorium. Such, in fact, was the state which Swift felt creeping on himself when he mournfully predicted that his fate would be to "die at top," the uppermost branches withering before the trunk was dead.

We mentioned above that to each of the typical forms of aphasia there was a cognate state from which at times it was hard to draw the line incisively. In the incipient stage of brain-softening, wherein the impairment of intellect and that of verbal memory proceed *pari passu*, we have a state not always distinguishable from the psychical type. The signs to guide us are the nature and degree of the disorder of the faculties, and whether language be more obliterated or pointless.

The second state of amnesia, in which the mental faculties are much less injured than the memory of words, is the chief province of the present disease. To estimate the loss sustained by the

^a Romberg Dis. Nervous System, Vol. ii., p. 302.

intellect in each case, the state of the faculties one by one should be noted. Are sensation and perception damaged? We present some familiar object to the senses of the person, and we infer from the animated glance with which it is recognized that those faculties are not materially defective. Is the memory of words weakened? We ask the name; an effort of recollection is made, evidently painful; it fails, and the poignant distress thereby caused is too obvious for mistake. We suggest the missing name; joy at recovering it beams forth again in the countenance, and words not occurring, gestures, such as "nods, and becks, and wreathed smiles," are had recourse to. In the same way as in the presentative faculties, the functions of abstraction, judgment, and reasoning, should be tested. The wider the contrast between the retained faculties and the lost speech, the nearer the approach to aphasia.

M. Jules Falret, in his elaborate summary, has tried to compress, under three categories, the chief forms which aphasia assumes, but his conditions seem rather too crowded for clearness. They admit of a succinct classification under the following subvarieties:— (1) Partial loss or perturbation of the memory of oral language, without any other change. (2) The same state of oral speech with ability to repeat the missing word, when suggested, but inability to write it. (3) The same state of oral speech as the first, with inability to repeat the word, but ability to write it. (4) The same state of oral speech, with inability both to repeat and write the missing word. (5) Total loss of oral speech, retaining ability to write. (6) The same, with inability to write. (7) Degeneration of speech into inane phrases or mere monosyllables. In practice these states often merge into each other.

Some of the varieties of erratic speech are curious. Crichton gives a case in which one letter, in a word, was substituted for another. It occurred after fever. The patient, a German, wished for some coffee (in his language, kaffee), but instead of f, he put z, so that instead of asking for coffee, he asked for a cat (kazze). In every word which had f, he made a similar mistake.^a I have a patient who substitutes d for n, calling neck "deck," &c. Villermay cites a case where the position of the letters was altered, as tuffle for flute.

Words are sometimes misplaced, the person having a consciousness of the mistake, but becoming bewildered at the moment. A

^a Inquiry into Mental Derangement. By A. Crichton, M.D. Vol. i., p. 373.

lady, Mrs. H., who afterwards died hemiplegic, had this peculiarity. She took a pride in her domestic *ménage*, and being desirous to tell her visitors that three of her servants had been comfortably married out of her house in 27 months, used to invert the figures, saying that 27 servants were married from her house in three months; and then seeing the incredulous stare of her hearers, she would perceive the blunder, and burst into a good-natured laugh at it. In the interesting case detailed by Dr. Banks, from the practice of Dr. Kidd and himself, some odd substitutions of words are given, one in which the gentleman fearing that his watch would fall out of his pocket and be broken, called out, "Take care of the break-fall."

Some examples of stock phraseology are amusing. One form of it is repetitive or eyelid. It consists in the unvarying utterance of the same word, or set of words—sometimes intelligible, sometimes not. A few years ago I had a case of this sort, in which the patient used to let off, at short intervals, like minute guns, the announcement, "My name is Cody." When a person, not in the secret, came near the bed, it created a flutter of surprise to be saluted with this formula of introduction. In another case the only words spoken were, "Where's my daughter?" the poor woman having been told suddenly that her daughter was dead and dis-sected; though she comes to see her once a week.

In some extreme cases language is confined to monosyllables. A woman named Jennings was for six or seven years in the Union Hospital with right hemiplegia. Her whole stock of words was "yes," "no," "too," and "oh God," which she uttered with various cadences to make herself intelligible.

The use of oaths in aphasia has been often noticed. I have now a patient in the infirmary whose answer to every question begins with "Oh! Begorrah!" After ejaculating this oath with great confidence in his powers of speech, the poor man comes to a full stop, ponders for the next word, and failing to find it, ends by making a frantic tug at his hair. Dr. Falret thinks that swearing occurs chiefly in emotional states. This is, I believe, often the case, but it also depends on the use of oaths as by-words from early habit. In odd persons the habit of strange by-words is regarded suspiciously as a flaw in the intellect. J. Frank had a patient who uneasily intercalated in his conversation the words, "hedera federa;" and the late very learned but very eccentric Vice-Provost Barrett could not utter a whole sentence without interpolating the by-word, "d'ye see me now?"

Coming now to the Executive division of the speech-process, we have first to consider its psychical part, viz., the will and the emotions, and their pathological conditions in aphasia. First, the autonomy of the will over the economy, not including its moral aspects, has a threefold relation—it directs thought, it originates muscular action, and it curbs the passions and emotions. Thus, we are conscious that by willing it we can make the mind take up, or lay down, any train of thought—that we can continue, or forbear, at pleasure, any muscular act, and, guided by reason, that we can keep our feelings in check, if we try. Now in each of these three functions the will is weakened in aphasia.

First, in its especial relation to the memory, namely, setting it to work to recollect things, and to judgment in its property of fixing attention upon the succession of thought—it becomes weak in purpose and desultory in application. Secondly, in its function of initiating muscular action, the will fails, at least in the *second* form of aphasia, to compel the muscles of articulation to act. Lastly, in its office of regulator of the emotions, the will is seriously compromised in aphasia. The emotions are good servants, but bad masters, and when the dominion of the will over them is weakened, they act despotically on mind and body. Locke had the sagacity to notice their power over memory. “Ideas are very often roused and tumbled out of their dark cells into open daylight by turbulent and tempestuous passion.”^a Some phenomenon like this occurs in the case of language in aphasia. Words start up unbidden under strong emotion, which are difficult to be uttered during moments of composure. The difference of emotional language in this respect has been described by Dr. Hughlings Jackson. Indeed, the influence of the emotions on language has engaged the attention of philologists; and Messrs. Wedgwood and Farrar have sought the origin of the primitive roots of language in interjections uttered in bursts of emotion.^b “Interjections,” says Horne Tooke, “are only employed when the suddenness and vehemence of some affection or passion returns men to their natural state, and makes them for a moment forget the use of speech.”^c The power of emotion in breaking off speech abruptly is well known to our great poets.

The singular change which passes over the feelings in paralysis was well described by Van Swieten. “I have seen the wisest men

^a Locke on the Human Understanding, Book 2, § 10.

^b Max Müller on the Science of Language, p. ix.

^c Div. of Pur., p. 32.

and the bravest soldiers, in whom the masculine strength had become so enervated that, like a pouting child, for the slightest cause they would burst into tears."^a It is asked whether these immoderate emotions occur most in aphasia, or in hemiplegia without aphasia. Dr. Trousseau thinks that in aphasia the emotions suffer but little change. Perhaps this is too strongly expressed. In one of the worst cases that I have seen of aphasia—that of Jennings—the emotions were uncontrollable. Van Swieten speaks thus of Malpighi, the famous anatomist, who died of right hemiplegia:—"Magnam in memoria et ratiocinio læsionem habuit, et quavis minima de causa lacrymabatur."^b I have made a table of twenty hemiplegic cases in a large hospital for three months. In eleven the right side was affected; in nine the left. Of the eleven right hemiplegics five had no undue emotions, four had them slightly, and two very much. Of the six last mentioned, weeping occurred in all, laughing absurdly in three. Of the five not affected, two showed great lesion of speech, while three had only thickness and slowness of utterance. On the other hand, one of the two immoderate cases was quite aphasic, the other not; and of the four slightly affected, one was completely aphasic, the rest very little so.

Of the nine cases of left hemiplegia one was quite aphasic, eight not. The emotions were normal in two, the others were variously affected. Two of the seven both laughed and wept upon trivial causes, three cried but did not laugh, and in two laughing only occurred. Of the twenty cases, eighteen were females. This table, as far as it goes, supports the inference that in left hemiplegia the emotions are mostly disturbed, whereas in right the disturbance is less. The case of left hemiplegia with aphasia evinced both kinds of emotion, but not very much. In right hemiplegia there was no obvious connexion between emotional force and loss either of speech or motor power.

We proceed, lastly, to the somatic or mechanical part of the Executive process, with which the volitional impulse must be placed *en rapport*, in order that the thought complete in words may be set in motion. Loss of verbal memory does not meet the cases in which the person cannot speak, but can write. There is a broken step in some part of the ladder; and pathologists, in reviewing the stages of the cerebral mechanism of speech, are not agreed about the

^a Van Swieten on Boerh. Tom. iii., § 1018.

^b Van Swieten loc cit.

defective part. The first hypothesis in physiological order, supposes a failure in the voluntary transmission of the thought-speech to the motor centre. A breach of continuity is presumed to take place in the white medullary substance, whose function is internuncial, with the effect of intercepting the words *en route* from their potential origin in the convolutions. Hence the intimation from the will not reaching the motor centre, the organs of speech make no response. This is the theory of *defective transmission*; and the powerful objection against it is, how can the speech-message be conveyed to the writing-hand, when it is stopped on its way to the muscles of articulation? To meet it, different sets of conducting fibres are supposed, or different centres of co-ordination, one for the muscles of speech, and one for those of the hand as a writing organ. Dr. A. Robertson,^a a very able advocate of this view, considers that the inability to speak is essentially a motor and not a mental defect, and hence not amnesic. His argument against amnesia runs thus:—Language is necessary for reasoning; reasoning exists in aphasics, therefore language exists in aphasics—a conclusion apparently at issue with general experience. Words are certainly necessary for *expressed* ratiocination, and are most important adjuncts to the operations of thought; but I believe that we can mentally think or reason about a thing, though the name may have escaped us for the moment, the mind tacitly putting some vague expression to stand for its recollected meaning, like the algebraic *x*. Further, the substitution of words and the degeneration of language, so simply explained by want of memory, are on this theory accounted for by the deflection of the words from their course in consequence of the damaged fibres, and the transmutation of them into those words which travel most frequently along the road. This ingenious supposition does not explain how the missing word can be repeated with ease when suggested.

The hypothesis next in order presumes *a change in the co-ordinating motor-centre for speech-movements*. Should we not, in such an event, expect to find a spasmodic and inharmonious action of the muscles of speech, such as the muscles assume in chorea? This question is one, however, that merits the most ample consideration.

A third mode of interpretation suggested by Dr. Osborne in 1833, and held also by M. Baillarger, is *the loss of the memory of the movements necessary for articulate language*. Dr. Osborne

^a Journal of Mental Science, Jan., 1867.

argues that the art of speaking is a voluntary process acquired in early life, every syllable requiring a distinct muscular act, which the child learns slowly, but executes rapidly on repetition. Dr. Osborne uses an illustration taken from Locke, that of an expert musician, who, though each note needs a separate stroke of the keys of an organ, and each stroke is a muscular act, yet plays on in train, though his thoughts may be wholly preoccupied.^a This is automatic; the will is directed to the *first* note, and the rest follow in the series, the separate volitions, once required, being now suppressed ("dropt volitions"), the intervention of the will being no longer needed, though a preliminary in all successions. Indeed, the effect of attention being suddenly directed to the steps of the process, puts it often astray. It is objected how could we ever recollect all the movements necessary for speech? In fact, we do not trouble ourselves to think of them. When we write, every letter of the word is an act of voluntary thought and movement, but so rapid from habit that nobody thinks of it as such. Dr. Osborne inferred that the peculiarity in his unique ease lay in the sudden oblivion of the whole art of speaking, which is so carefully learned in childhood, all other requirements being normal. The only mode of treatment is to begin *de novo* to re-establish the autocracy of the will.

We mentioned above that there was also an allied state sometimes hard to be distinguished from the second typical form of aphasia. It is the complication with paralysis of the articulating organs. It becomes hard to assign how much may be due to the cerebral source of loss of speech, and how much to the local palsy. The following extreme case of glossoplegia has some features resembling the standard case given by Dr. Osborne:—

Mr. J., aged thirty-five, when a medical student, seven years ago, got right hemiplegia. He was admitted into the Infirmary at the end of 1866. Speech is utterly lost; fingers of right hand rigidly flexed; whole limb is cold, and hangs down; right leg allows imperfect progression; deglutition affected; he can only swallow food in a semi-solid state; tongue tremulous, and protruded slowly and laboriously to half its usual extent. On laughing he utters a hoarse sound like a person choking, with spasmodic sobs. His intellect is not much impaired; sight and hearing good; memory of words not injured. He is fond of reading, and can write correctly

^a Locke, Book ii., ch. 33. On Association.

with the left hand; but from not being used to it, he prefers dictation. He does this by means of a printed alphabet, and he spells so rapidly by the finger the words which he wants written that it requires practice to follow him. His letters are expressed with clearness and point. The emotional powers are undisturbed.

Having endeavoured to describe the pathological characters of aphasia, we shall say a few words on its presumed seat in the brain.

It is not easy to discover the period when the special faculties of the mind were first allocated to distinct parts of the brain; but we find the germs of phrenology in the opinions of Theophilus and the Arabians, who placed phantasia, or the presentative faculty, in the anterior lobes; discursus, or cogitation, in the middle; and memory, as the lowest faculty, in the posterior.^a Dr. Gall located the intellectual powers in front; the moral sentiments in the coronal regions; while he relegated the animal passions, &c., to the posterior lobes. Remarking that a full, prominent eye co-existed with a facility of acquiring languages, this acute cranioscopist placed the working organs of speech in the convolutions resting upon the orbital plates, and the memory of words, &c., in the posterior part of the same. That very thoughtful and suggestive writer, Sir Henry Holland, long ago hinted that an excellent way to test phrenology would be to select some simple faculty, such as *language*, or music, or number, which has no opposing influence, and whose perfection can be attested.^b It is curious how this suggestion of Holland, made thirty years ago, about language, as one of the three tests most applicable, should be that which M. Broca now represents as discovered. If verified, it will undoubtedly prove the $\pi\omicron\tilde{\upsilon}$ $\sigma\tau\tilde{\omega}$, or stand-point of other discoveries.

We mentioned above that the merit is due to M. Bouillaud for seeking *practically* to fix the cerebral seat of speech, or, as he terms it, "*le pouvoir législateur de la parole*," in the anterior lobes. During forty years of medical life, he has accumulated some hundreds of cases tending to show that in lesions of the anterior parts of both hemispheres speech is impaired; and *e contra*, when this faculty seriously suffers, the diagnosis of lesion of the anterior, and not of the middle or posterior lobes, may be made unhesitatingly. That this dogma is untenable has been urged by many, amongst others by M. Andral, who found that in thirty-seven cases of disease of the anterior lobes,

^a Avicenna lib. 1, can. fen. 1, Tr. 6. Averrhoes Collig. 2, 20.

^b Med. Notes and Reflections, chap. 30.

speech was abolished twenty-one times, and retained sixteen times. On the other hand, of fourteen unequivocal cases of loss of speech, seven were associated with lesion of the middle, and seven of the posterior lobes.^a It was supposed that traumatic injuries would decide the point more veritably; and M. Velpeau cited a case of great organic destruction of the anterior lobes by a tumour, without loss of speech. As the man was a barber, his retention of speech may not be quite conclusive. There are, in our own literature, some curious cases which sustain M. Velpeau. Mr. O'Halloran gives an instance in which a large quantity of the right anterior lobe was destroyed by suppuration, yet the patient retained his speech and faculties to the last, having lived seventeen days.^b A still more remarkable case is described by the late Surgeon-General Crampton.^c In 1818, Mr. H. Brougham, aged eighteen, nephew to Lord Brougham, received a gun-shot wound in the forehead, which exposed the anterior lobes. "In cleansing the wound, scarcely had three drops of water fallen on the part when he cried out:—'Oh! don't! Oh! what's that?' I asked him," says Sir Philip, "if I had hurt him? He said 'I do not know, but the sensation is dreadful.'" This great wound of the frontal convolutions healed up in time, leaving a depression, which pulsated like the fontanelle of an infant. Yet this gentleman, so far from losing his speech, took holy orders in the Church, and became a most efficient preacher.

M. Marc Dax, in 1836, is well entitled to the credit of being the first to show that in loss of speech, the lesion mostly exists in the left hemisphere, and that, should hemiplegia be present, it engages the right side, and seldom or never the left.^d It cannot be denied, that to assume for the faculty of speech a unilateral seat in a bilateral organ shocks our preconceived notions, and can only be settled by experience. But as we must, from our very nature, theorize, we are pressed to admit one of two conclusions—either that this faculty is strictly limited to the left half of the brain, while the necessary motor acts are consensual at both sides; a theory which is opposed to the argument from analogy, that parts which correspond in relation and sensible qualities, correspond

^a Clinique Med., translated by Spillan, p. 118.

^b Disorders of the Head. By S. O'Halloran, M.D. Case 17, p. 103.

^c Dublin Journal of Medicine, Sept., 1832, p. 42.

^d Dr. Sanders has noticed, as peculiarly appropriate to amnesia, the passage from Virgil, viz. :—"Memini, si verba tenerem," which M. Dax takes as a motto for his work. It would be so, but that, unfortunately, the word "*numeros*" is omitted by M. Dax. In Virgil it means :—"I remember the music of the Idyll, but I forget the words."

also in function; or, secondly, that the situation of the centre of speech in the left hemisphere implies a great preponderance of that side of the brain over the other in their working capacities, just as we speak, in mercantile phrase, of the acting and sleeping partners in a firm. This latter possibility has been ingeniously defended by Dr. Moxon.^a

Of the nine cases of left hemiplegia above noticed by me, eight had no defect of speech worth notice, the ninth was quite exceptional.

Margaret Neil, aged forty-five, was admitted to the infirmary, January 31, 1867. She had total hemiplegia of the *left* side, anæsthesia, and loss of speech. Emotions greatly disturbed. Omitting details, the state of her speech eight weeks after admission was as follows:—pronunciation very good; she articulates long words, as “Constantinople,” perfectly, and with the proper syllabic accent. Her memory of words is much injured; when shown familiar objects, she seems trying her best efforts to recall the name—“’tis ah! ’tis ah!”—and gives it up. On suggesting a name not that of the object, she gets offended—crying out:—“Ah! no.” On hinting the missing word, she is pleased, repeats it distinctly, but soon forgets it again. In her replies to me she says “Yes, ma’am,” or “No, ma’am,” much to the amusement of the students. Asked to tell her name, she pauses, and replies:—“I can’t tell it, but I know it;” on prompting her, she repeats it with a laugh. She cannot calculate beyond twice two, and has lost the power to read. She cannot *commence* the series of months, but when January is mentioned she goes on pretty well, with a gap here and there. At the present time (July 1st), her memory of words has much improved; she is able to walk, the left arm has also partially recovered. In this case the two kinds of memory are to be distinguished. She *recognized* the word wanted, when it was suggested to her, but could not *reproduce* it.

It is to be regretted that collections of cases, like those of Dr. Bright, do not assist us much, the state of the faculty of speech not being always given. As far as they go, they support the more constant connexion of dextral paralysis with loss of speech. He gives, however, five cases of left hemiplegia, viz.:—cases 85, 140, 145, 158, 160, in which speech was involved.

The next forward movement was made by M. Paul Broca, in

^a Med. Chir. Rev., April, 1866.

1861, and was more a stride than a step. His doctrine fixes with more rigorous precision than that of M. Dax, the seat of aphasia, namely, the third external or inferior frontal convolution of the left side of the brain. In this he not only accords with M. Dax in giving speech a unilateral seat; but his dissections have led him to localize it in a gyrus as far removed as possible from the right hemisphere. Were we to estimate the preponderance of the left over the right hemisphere in speech-power, by their distances from Broca's convolution as centre, measured inversely by their squares, it might give us something tangible. But all vain speculations must bend to practical facts.

The following case bears on M. Broca's views:—

Mitral Disease—Hemiplegia—Aphasia—Death from Pneumonia—Embolism.—Mary Murphy, aged sixty, was admitted to the Union Hospital, April, 1865, with right hemiplegia and defective speech. She was in hospital various times during eighteen months, so that her speech was tested from time to time. The memory of words was very defective and the articulation confused; for “thank you sir,” she said “fancy sell,” and being asked what her husband, a pedlar, sold, replied, “proeties and pudding-pans,” which we found out meant “brooches and bosom-pins.” It was found that she had stenosis of the mitral valve, leading to the supposition of embolism as the cause of the paralysis. The right arm was rigidly flexed, the leg was weak, but allowed her to walk with a stick, the emotional powers very much disturbed, the intellect tolerably clear, especially on money matters. In hospital she went by the name of “the serjeant,” from the state of discipline in which she kept the patients, using her stick on occasion. We could not test her by books, as she could not read; some words she constantly misapplied. Her attempts at speech utterly failed to convey any meaning. She died of pneumonia after a few days' illness. The right lung was much hepatized; the heart covered with fat; the left auricle contained a decolourized clot moulded to its walls; buff-coloured plugs extended for two inches into the pulmonary veins, and similar emboli blocked up the right cavities and pulmonary artery. The mitral orifice was narrow, its margins ossified, vegetations were on the auricular surface, the aortic valves were sound. There was much effusion of serum under the arachnoid membrane, the right hemisphere was healthy, except some venous dots sprinkled over the centre of Vieussens, and a little fluid in the ventricle. On careful examination of the left hemisphere, the convolution of Broca was

softer in consistence than the neighbouring parts, and the remains of an apoplectic cyst, of the size of an almond and empty, but with erosion of its floor, was situated close to the anterior third of the corpus striatum and running parallel to its course. No emboli were found in the cerebral arteries. The preparations were laid before the Cork Medical Society.

These remarks would be imperfect without alluding to a point so much contested as the name. The term Aphasia, from its simplicity and softness of sound, has come into such general favour that it could not now be changed without much confusion. It is a poetic word used by Homer and Euripides (Sophocles nowhere employs it), and by prose writers, such as Herodian, is applied to collective bodies; but in no place does it mean more than a *temporary* failure of words under strong emotion. None of the great medical writers have applied it to loss of speech from disease. The luxuriance of the Greek language was such that as many as ten or more verbs were formed to indicate the delicate shades of expression, but the terms most in use amongst the Greek physicians for loss of voice and speech, were Aphonia and Anaudia, which were sometimes, as Cælius Aurelianus tells us,^a interchanged, but the latter word was more usually applied to a loss of the power of speaking, in which sense it occurs in two passages of the Septem Contra Theb. of Æschylus.^b Sometimes loss of speech or of voice was expressed by a periphrasis, such as "apocope vocis," or "abscissio," or "amputatio vocis," as was used by Avicenna. As to the other names they need not detain us long. The Aphemia of M. Broca is a word not in use, and rests, according to R. Stephens, on questionable authority. His Aphrasia is also a coinage, and would imply a defect in grammatical more than in physiological speech. Alalia is a favourite in France. It does not occur in any Greek writer, or in any lexicon that I know of, except Brunek's on Sophocles, and then in a different sense; its adjective, alalos, *dumb*, occurs in the Greek Testament^c and in Æschylus, and its simple word, lalia, means more the subject and form than the power of speech.^d Lastly, of Aphthenxia as a fit epithet for loss of the ability of utterance, I have already spoken in the number of this Journal for November, 1865.

^a Cæl. Aur. de Morb., p. 96.

^b V. 82 and 892, and Blomfield's Glossary.

^c Mark ix., 17.

^d Matt. xxvi., 73.

In conclusion, we owe M. Broca much praise for directing attention to a subject too much forgotten. Careful investigations in the present direction must lead to new discoveries upon the whole subject of language.

